(d) activating the recipient cell before, during or after nuclear transfer; and

(e) incubating the reconstituted cell such that an embryo develops that is capable of developing to term.

91. (NEW) A non-human mammal, wherein the mammal is cloned from a pre-existing, individual non-human mammal by a process comprising:

(a) obtaining a cell from the pre-existing, individual non-human mammal;

(b) genetically modifying the cell;

(c) transferring the nucleus of the genetically modified cell into a suitable enucleated recipient cell of the same species, thereby obtaining a reconstituted cell, wherein the genetically modified cell is a quiescent diploid cell;

(d) activating the recipient cell before, during or after nuclear transfer; and

(e) incubating the reconstituted cell such that an embryo develops;

(f) transferring the embryo to a female of the same species; and

(g) developing the embryo into a non-human mammal. --

REMARKS

Reconsideration of this application is respectfully requested.

Claims 20-55 have been canceled. New claims 56-91 are derived from canceled claims 20-55. No new matter is introduced through this amendment.

Rejections under 35 U.S.C. § 101

Claims 20-22, 24-36, 38-42, 43-47, 49-52, 54, and 55 were rejected under 35 U.S.C. § 101 as allegedly being drawn to non-statutory subject matter. The Office Action asserts that applicants' claimed mammalian embryos and mammals are not distinguished over a mammalian embryo or mammal found in nature. Specifically, the

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Office Action contends that the claimed mammalian embryos and mammals are produced by a particular process, but are not altered by the process so that the "hand of man" is present. Applicants traverse the rejection.

Applicants claimed mammalian embryos and mammals are clones of a pre-existing mammal. The cloned embryos and mammals have the same set of chromosomes as that pre-existing mammal. Without the intervention of man, applicants' clones would not exist.

More particularly, a single parental animal provides the chromosomes of the clone, which is asexually reproduced. This is not the case with mammals found in nature. Mammals found in nature arise from the combination of chromosomes from two distinct parents and are sexually reproduced. In this important aspect, applicants' clones are unlike any mammalian embryos and mammals that exist in nature. Thus, the "hand of man" must be present to create applicants' clones.

The Office's position is contrary to legal precedent set forth by the Supreme Court in *Diamond v. Chakrabarty*, 447 U. S. 303, 206 U.S.P.Q. 193 (1980). In *Chakrabarty*, the Supreme Court indicated that Congress intended statutory subject matter to include **anything under the sun that is made by man**. 447 U.S. at 309, 206 U.S.P.Q at 197. There can be no doubt that applicants' claimed clones are made by man *and do not exist in nature*. Thus, they must be considered statutory subject matter. *See id.* Accordingly, applicants respectfully request withdrawal of the rejection.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 20, 23, 35, 37, 46, 48, 51, and 53 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. The Office Action asserts that claims

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23, 37, 48, and 53 are unclear in whether the resultant embryo or mammal has the same set of chromosomes as a nonhuman, non-embryonic mammal of the same species. Applicants traverse the rejection.

The Office Action gives no reasons why claims 20, 35, 46, and 51 were included in this rejection. Accordingly, applicants submit that the rejection of claims 20, 35, 46, and 51 is improper.

Applicants disagree with the Office's characterization of the claims as meaning that the transferred cell is from a transgenic mammal. As described in the specification, transgenic animals can be produced from genetically altered donor cells. (Specification at 5, lines 27-29.) Gene targeting permits subtle genetic alteration. (*Id.* at 6, lines 4-5.) The specification describes that genetic modifications may take place prior to nuclear transfer. (*Id.* at 7, lines 4-6.) The specification describes genetic modification during cloning. (*Id.* at 19, lines 29, though page 20, line 23.) Applicants' new claims 90 and 91 clarify that genetic modification takes place during cloning. Accordingly, applicants respectfully request withdrawal of the rejection.

Rejections under 35 U.S.C. § 102(b)/103(a)

The pending claims were variously rejected over several publications that teach the production of reconstituted embryos and mammals by nuclear transfer, where the donor nucleus is from an embryonic cell. (McLaughlin et al., 1990; Prather et al., 1989; Yong et al., 1991; Cheong et al., 1993; Yang et al., 1992; Sims et al., 1991; and Sims et al., 1991, in view of Hyttinen et al., 1994). In each of these references, the donor nucleus is from **an embryonic cell**. The resultant mammals/embryos in each of the references are the products of conventional reproduction in that they arise from the

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combination of male and female gametes to form **an embryonic cell**. Thus, the animals described in these references do not have the same set of chromosomes as either one of their parents, but are genetic composites, containing chromosomes from each parent. The animals described in these references are not "clone[s]" of a "pre-existing, individual non-human mammal" as recited in applicants' claims.

Anticipation under 35 U.S.C. §102 requires that every element and limitation of the claimed invention must be found in a single prior art reference, arranged as in the claim. *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383, 58 U.S.P.Q.2d 1286, 1291 (Fed. Cir. 2001).

The embryos and mammals of the cited references cannot anticipate applicants' mammals and embryos because they do not have every element and limitation of the claimed invention. Applicants' mammals and embryos are "clone[s]" of a "pre-existing, individual non-human mammal" and have "the same set of chromosomes" as that pre-existing mammal. They are asexually reproduced. This is not the case with the mammals and embryos of the cited references, which were made by nuclear transfer from **embryonic cells**. The mammals and embryos of the cited references have the same set of chromosomes as an **embryonic cell**. The embryonic cell received its set of chromosomes from two pre-existing mammals. Consequently, the mammals and embryos of the cited references have a mixture of the genetic material of two pre-existing mammals. They are not clones of a pre-existing mammal. Accordingly, the mammals and embryos of the cited references cannot anticipate applicants' mammals and embryos.

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In view of this important difference, applicants' claimed embryos and mammals cannot be considered identical in structure or composition to the mammals and embryos of the cited references. Thus, the Office has not established a *prima facie* case of anticipation.

Applicants disagree with the Examiner's contention that the source of the donor nucleus does not provide a patentable distinction to the resulting embryo or mammal. The Examiner has cited no evidence in support of this contention. If the Examiner is relying on facts within the personal knowledge of the Examiner in making this rejection, applicants respectfully request that the Examiner provide an affidavit in support of this contention. *See* M.P.E.P. § 2144.03.

In contrast to the Office's contention, an embryo/mammal's characteristics are defined by the source of its nuclear material, *i.e.*, chromosomes, together with environmental factors. Applicants submit Ayala et al., 1980 (Exhibit 1), as evidence that the observable characteristics of an individual (phenotype) result from the interaction between the genotype of an individual and the environment in which development occurs.

An embryo or mammal that receives its set of chromosomes through sexual reproduction from two parents will not be the identical or substantially identical to an embryo clone that receives its set of chromosomes asexually through cloning. Only the embryo or mammal that receives its full set of chromosomes from a single parent will be a clone of that parent. An embryo that receives its set of chromosomes from two parents will be a mixture of the genetic material of the two parents.

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The embryos and mammals of the cited references have a mixture of the genetic material of two parents. The mixture of genetic material will have profound effects on the characteristics of the embryo or mammal. The embryos and mammals of the cited references are not clones of a pre-existing mammal. Therefore, the embryos and mammals of the cited references cannot anticipate applicants' claimed embryos and mammals.

In addition, applicants' claimed embryos and mammals had never existed prior to applicants' invention. Due to environmental factors, applicants' clones would differ from even the parental mammal. For example, applicants' clones would have different fingerprints, different irises, different retinas, and different skin and fur pigmentation patterns. As objective evidence of the existence of these differences, applicants provide Prather at 10 (Exhibit 2), U.S Patent 4,641,349 of Flom et al. at 4 (Exhibit 3), and Wells et al. at 1003 (Exhibit 4). As taught in these references, a clone will not be completely identical to its parent. Accordingly, a clone cannot be anticipated by its parent.

In addition, the cited references do not make applicants' claimed embryos and mammals obvious. Based on the cited references, the skilled artisan would not have known how to create applicants' claimed mammals and embryos. What cannot be contemplated or conceived cannot be obvious. *In re Deuel,* 34 U.S.P.Q.2d 1210, 1215 (Fed. Cir. 1995). Accordingly, applicants' claimed mammals and embryos cannot be considered obvious.

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